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SELECTED SCIENCE AND TECHNOLOGY STATISTICS

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Introduction

Science and Technology (S&T) is defined by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as *"...systematic activities which are closely concerned with the generation, dissemination and application of scientific and technical knowledge in all fields of science and technology."*

Canada uses the definition of research and development (R&D) found in the *Frascati Manual*, published by the Organization for Economic Cooperation and Development (OECD). It is *"...creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications."*

Related scientific activities (RSA) are those activities that complement or extend R&D by contributing to the generation, dissemination and application of S&T knowledge, such as routine data gathering and services provided by technical libraries.

In order to make use of statistics, analysts often put them into context by comparing the measured quantity with some other variable, such as time or geographic location. For practical reasons, it is usually necessary to modify S&T statistics to take into account the wide variation in size of national or provincial economies, populations, etc. Thus, S&T indicators are usually expressed as a ratio of two statistics: the numerator is the specialized statistic, such as R&D spending, and the denominator is a general statistic, such as GDP or population.

Abbreviations

BE	–	business enterprise
BERD	–	business enterprise expenditure on research and development
GDP	–	gross domestic product
GERD	–	gross domestic expenditure on research and development
HERD	–	higher education expenditure on research and development
ISTC	–	Industry, Science and Technology Canada
PNP	–	private non-profit organization
PRO	–	provincial research organization
R&D	–	research and development
RSA	–	related scientific activities
S&T	–	science and technology

A publication of this type is a snapshot, freezing information at a particular point in time. New data are constantly becoming available. Data in tables may not necessarily add to the totals shown due to rounding.

National GERD, 1985-1992

	1985	1986	1987	1988	1989	1990	1991p	1992p
	(\$ millions)							
Actual \$	6 800	7 355	7 743	8 249	8 777	9 511	9 737	10 015
1986 \$	6 967	7 355	7 395	7 533	7 639	8 019	7 988	8 156
	(percent)							
Real growth	8.8	5.6	0.5	1.9	1.4	5.0	-0.4	2.1
GERD/GDP	1.42	1.45	1.40	1.36	1.35	1.42	1.44	1.46

p Preliminary data.

Source: Statistics Canada and the Bank of Canada.

Expenditures on R&D, by Performing and Funding Sectors, 1992

Funder	Performer						Total	Distribution
	Federal	Provincial	PRO	BE	University	PNP		
	(\$ millions)							(%)
Federal	1 682	-	9	395	864	29	2 979	30
Provincial	-	242	56	84	330	16	728	7
PRO	-	-	1	-	-	-	1	0
BE	-	-	30	3 854	163	14	4 061	40
University	-	-	-	-	1 025	-	1 025	10
PNP	-	-	-	-	208	52	260	3
Foreign	-	-	5	934	13	9	961	10
Total	1 682	242	101	5 267	2 603	120	10 015	100
Share of Total (%)	17	2	1	53	26	1	100	

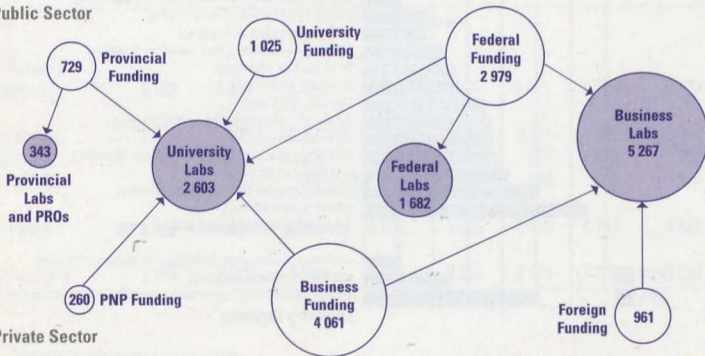
Source: Statistics Canada.

R&D Spending Flows, 1992

(Size of symbols is to scale)

(Millions of Dollars)

Public Sector

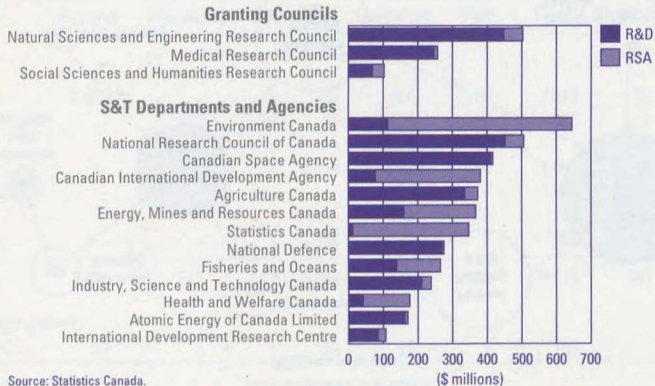


Private Sector

Source: Statistics Canada.

(Transfers of less than \$100 million not shown)

Federal S&T Expenditures, by Department and Agency, 1992-93



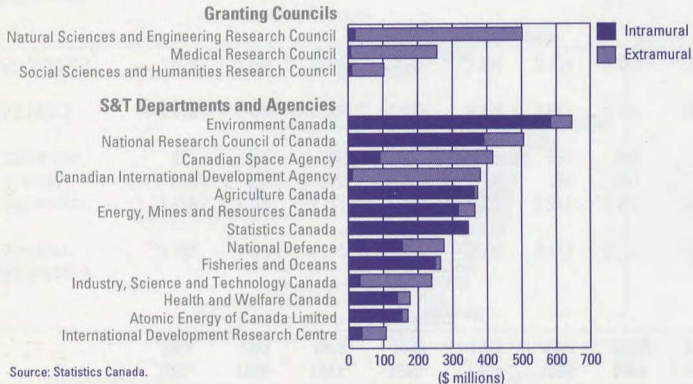
Federal S&T Expenditures, 1985-86 to 1992-93

	1985- 1986	1986- 1987	1987- 1988	1988- 1989	1989- 1990	1990- 1991	1991- 1992p	1992- 1993p
(\$ millions)								
S&T Actual \$								
of which:	4 142	4 454	4 512	4 823	5 066	5 471	5 775	5 922
Intramural	2 570	2 790	2 721	2 833	3 026	3 311	3 464	3 486
Industry	613	639	708	799	780	751	921	987
University	637	662	696	761	807	926	948	974
S&T 1986 \$	4 240	4 454	4 309	4 400	4 409	4 613	4 737	4 826
R&D Actual \$	2 454	2 552	2 586	2 802	2 984	3 174	3 343	3 531

p Preliminary data.

Source: Statistics Canada and the Bank of Canada.

Federal S&T Expenditures, by Performing Sector, 1992-93



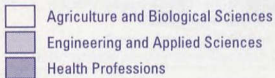
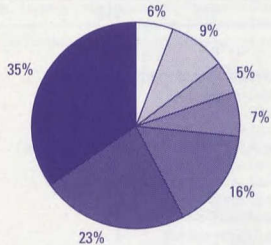
University R&D Funding, by Source, 1990

	Federal	Provincial	Business	Self-funded	Other	Total
	(\$ millions)					
Nfld.	17	1	1	21	4	44
P.E.I.	1	-	-	2	-	3
N.S.	48	5	5	33	3	94
N.B.	11	4	3	14	1	33
Que.	213	106	47	267	57	690
Ont.	299	122	65	387	85	958
Man.	30	6	3	43	15	97
Sask.	24	13	3	44	3	87
Alta.	71	34	14	110	21	250
B.C.	101	19	13	44	20	197
Canada	815	310	154	965	209	2 453

Source: Statistics Canada.

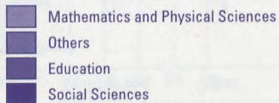
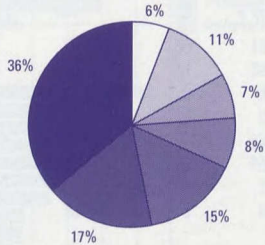
Graduate Degrees by Field of Study, 1981 and 1991

1981 Total = 14 719

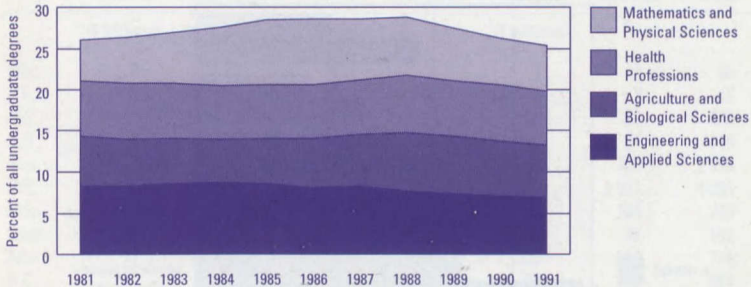


Source: Statistics Canada.

1991 Total = 20 936

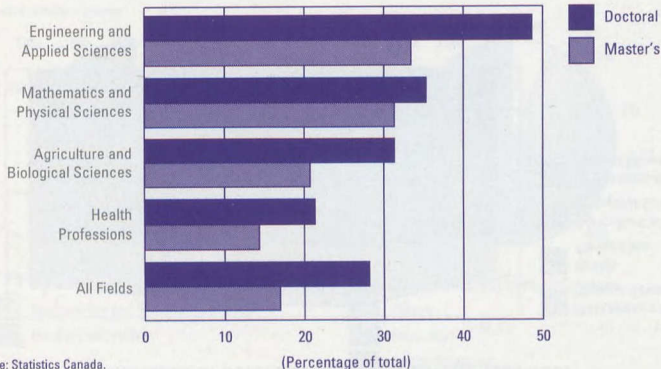


Bachelor's and First Professional Degrees Awarded in the Natural Sciences and Engineering, 1981-1991



Source: Statistics Canada.

Foreign Students as a Percentage of Full-time Graduate Enrolment in Selected Fields of Study, 1991-92



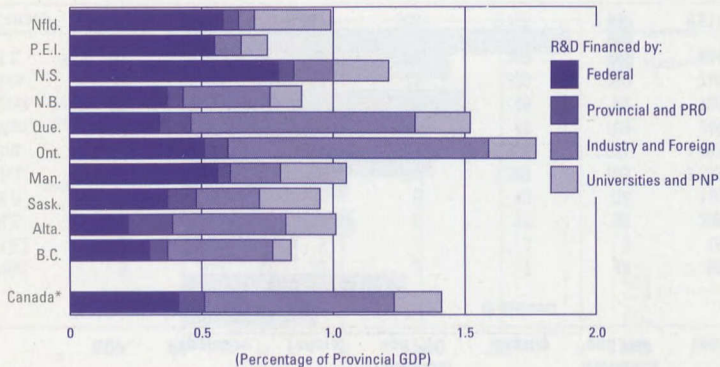
GDP, Population and R&D Performance, by Province, 1990

	GDP	Population	Federal	Provincial and PRO	Industry	University and PNP	Total
	(\$ billions)	(thousands)			(\$ millions)		
Nfld.	9	573	32	3	7	44	86
P.E.I.	2	131	9	-	3	3	15
N.S.	17	895	78	6	29	95	208
N.B.	13	722	31	5	46	34	116
Que.	154	6 768	181	74	1 389	709	2 353
Ont.	277	9 750	924	101	2 837	1 031	4 893
Man.	24	1 089	94	3	49	103	249
Sask.	20	997	46	11	49	87	193
Alta.	71	2 473	66	71	323	250	710
B.C.	81	3 132	86	29	369	200	684
Canada*	670	26 610	1 547	303	5 105	2 556	9 511

*Includes Yukon and Northwest Territories.

Source: Statistics Canada.

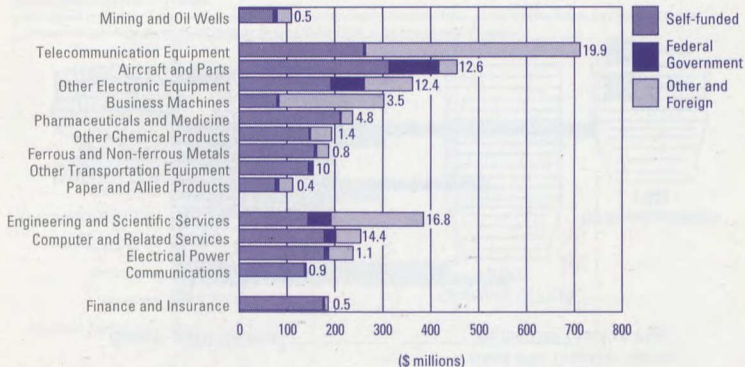
R&D Funding as a Percentage of Provincial GDP, by Province, 1990



*Includes Yukon and Northwest Territories.

Source: Statistics Canada.

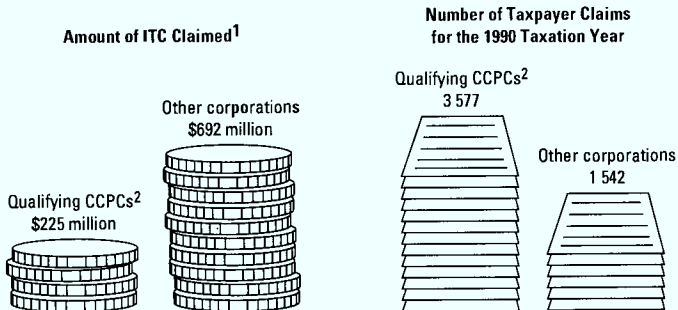
Industrial R&D by Source of Funds, 1990



*Numbers represent R&D as a percentage of sales in the sector.

Source: Statistics Canada.

Investment Tax Credit, 1990

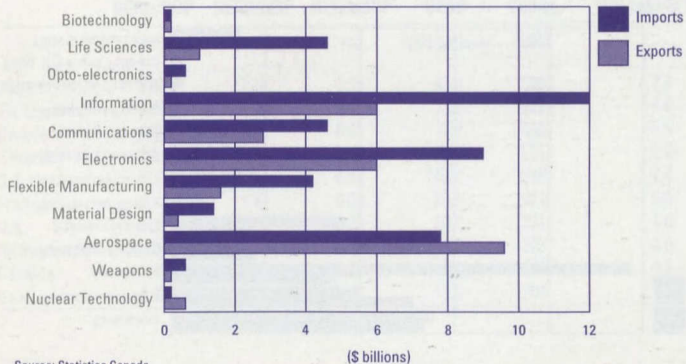


¹ The amount claimed is the amount requested by the taxpayer prior to an audit and/or assessment.

² A qualifying CCPC is a Canadian-controlled private corporation whose taxable income for the preceding year was \$200 000 or less.

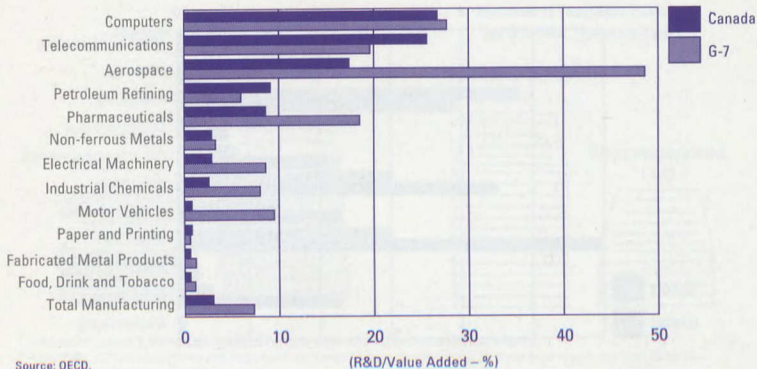
Source: Revenue Canada — Taxation.

Canada's Trade in Advanced Technology Products, 1991



Source: Statistics Canada.

Comparisons of Industrial R&D Spending, Canada versus G-7, 1989



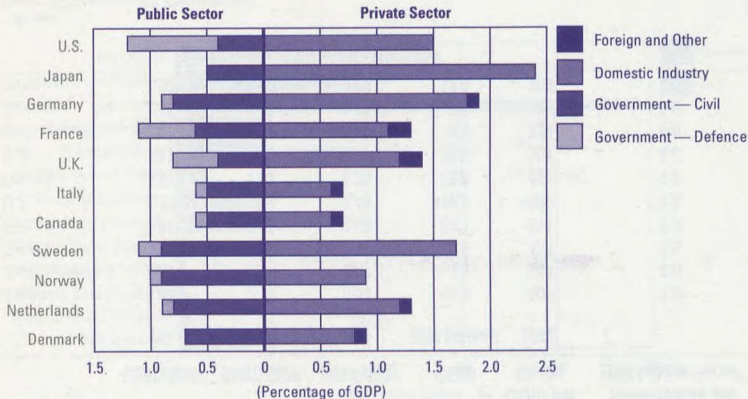
Selected International Comparisons of GERD, 1990

	GERD/GDP	BERD/GDP	HERD/GDP	GERD	GERD per Capita	Researchers per 1000 Labour Force*
	(%)	(%)	(%)	(US\$ billions)	(US\$)	
Japan	2.88	2.18	0.35	62.9	509	7.3
Switzerland*	2.86	2.14	0.57	3.8	567	4.0
Sweden*	2.85	1.82	0.91	3.9	463	5.5
Germany	2.81	2.02	0.40	32.3	511	5.9
U.S.	2.77	1.94	0.44	149.2	593	7.6
France	2.42	1.47	0.35	23.8	421	5.0
U.K.	2.21	1.47	0.33	20.2	351	4.6
Netherlands	2.06	1.16	0.48	4.8	323	4.0
Canada	1.41	0.77	0.35	7.2	270	4.6
Italy	1.30	0.76	0.27	12.0	208	3.1

*1989 data.

Source: DECD; Japanese data adjusted by DECD.

GERD by Source of Funds, Selected Countries, 1989



Source: National Science Foundation of the United States and OECD.

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